

THE PLIGHT OF SANITATION MANAGEMENT IN SELECTED BOTSWANA SCHOOLS – A CRITICAL CONCERN

Nthalivi Silo, PhD

Department of Primary Education, University of Botswana, Gaborone

Abstract

One of the major environmental challenges that Botswana faces as identified by the Botswana national Conservation Strategy of 1990 is pollution. While acknowledging the effort and many achievements government has made towards addressing this challenge, serious environmental problems particularly poor waste and sanitation management are now threatening the sustainability of the major settlements, particularly schools where sanitation, specifically toilet sanitation doesn't seem to get priority attention in the school environmental sanitation management activities. Drawing on cases studies from three schools in Botswana, focus group discussions with pupils and interviews with teachers and cleaners were conducted to investigate the state of sanitation management and how it is dealt with. Findings indicate that toilet sanitation is neglected as schools are more involved in routine activities which are not action oriented towards creating a sustainable healthy environment in the schools.

Keywords: Sanitation management, socio-ecological challenges, primary schools, environmental health, action competence

Introduction

Botswana is rated one of the most successful democracies in Africa and is currently regarded as a model of African democracy and human development (Preece & Mosweunyane, 2004). By most accounts there has been tremendous progress and phenomenal and unprecedented growth in the economy and since independence in 1966, but the country still faces a number of socio-ecological challenges (UNDP Botswana Human Development Report, 2005; Maundeni, 2004; Maundeni & Mookodi, 2004). In spite of the advances that the country has made in the last four decades from being among the least

developed nations to its current status as a middle income country, it faces challenges that range from poverty, unemployment, HIV AIDS, environmental sustainability issues that include land degradation, energy shortages and pollution, waste and sanitation due to rapid urbanisation UNDP Botswana Human Development Report, 2005; Maundeni & Mookodi, 2004; Botswana Government NDP 9, 2003). While acknowledging the effort and many achievements government has made towards addressing these challenges, these problems specifically poor sanitation have been exacerbated by excessive dependence on the state. A slow pace of citizen empowerment to address these challenges continues to be identified as the country's foremost development challenge which threatens to reverse the economic development advances made so far (Preece & Mosweunyane, 2004; Botswana Government, 2003; UNDP Botswana Human Development Report, 2005; Ditshwanelo, 2008).

Challenges of sanitation management in Botswana

One of the major environmental challenges that Botswana faces as identified by the Botswana national Conservation Strategy of 1990 is pollution. Municipal authorities in Botswana are overwhelmed in their provision for the infrastructural and human needs of the growing populations, and serious environmental problems particularly poor waste and sanitation management are now threatening the sustainability of the major metropolitan areas, particularly the low income neighbourhoods (Gwebu, 2003; Toteng, 2001; Molebatsi, 1998; Segosebe & Van der Post, 1991). Due to overcrowding low income urban neighbourhoods lack adequate water and sanitation facilities as well as facilities for the collection and disposal of solid waste (Gwebu, 2003, p. 410-411). Gwebu submits that

Due to overcrowding, the cleaning and maintenance of latrines in the low-income areas is so poor that the facilities have become a major health hazard which people avoid getting close to. Pit latrines also fill up rapidly, and due to inadequate facilities for their regular drainage, they overflow. Municipal authorities lack sufficient human and infrastructural capacity to deal effectively and timeously with the garbage generated by households.

This poses serious health problems for inhabitants in these residential areas which comprise the largest proportion of urban and peri-urban populations in the country as revealed by Gwebu (2003, p. 418).

Clinic records indicate that the main health problems among infants and children are communicable ones, namely; respiratory infections, skin infections, diarrhoea and minor injuries... Among the adults, STDs and HIV-AIDS, tuberculosis and hypertension are

common. Typically, these diseases are closely related to overcrowding. The contraction and spread of these diseases is further facilitated by lack of hygiene.

Gwebu argues that the environment that exists in these crowded neighbourhoods, inadequate infrastructure, poor sanitary conditions, lack of storm water drainage and littering have instilled negative feelings in the residents regarding the quality of their day to day lives (p. 420).

With particular reference to education, the government has re-committed itself and made progress through various initiatives and programmes that seek to work towards achieving the objectives and targets of the plan of action which are related to the Millennium Development Goals (MDGs) (Botswana Government/UNICEF, 2007). The actions and initiatives are taken schools by the government in collaboration with civil society and other partners by analyzing and drawing attention to challenges faced by citizens.

But statistical economic growth rates, reviews and assessments on the progress made in addressing the environmental challenges faced by the society have tended to conceal the extent of these challenges and the extent to which schools participate in the mainstream socio-economic activities in Botswana (Preece & Mosweunyane, 2004; Fako & Molamu, 1995). There is therefore a need to foreground the role that schools can play given that the socio-ecological influences and challenges affect them directly. From this highlight of the socio-ecological realities that directly affect schools, the consequent implications of all these challenges require new forms of approaches to dealing with them. These human development challenges demand and require identifying schools' priorities and empowering them to transform the conditions they experience in their lived contexts. One way of doing this is to target schools by re-orienting their education towards more pro-active sustainable ways of engagement in a more articulated way through relevant civic and environmental education.

An emerging research focus

Environmental learning activities in Botswana have become a central component of environmental education in formal education in order to address environmental challenges that the nation is grappling with. The introduction of environmental education in schools was one of the main recommendations of the 1994 Revised National Policy on Education (RNPE) intended to respond to the country's environmental and related socio-ecological challenges (Botswana Government, 1994). Botswana's 1990 National Conservation Strategy (NCS) influenced this recommendation after it identified a number of environmental challenges including pollution as one of the major environmental problems facing the country. It particularly identified general poor waste and sanitation management as a key environmental

challenge partly due to the reasons outlined in the previous section (Gwebu, 2003; Toteng, 2001; Molebatsi, 1998; Segosebe & Van der Post, 1991). The strategy according to Botswana Government (2002, p. 15) submitted that

Land pollution stems primarily from poor waste disposal and management. Problems associated with waste management in Botswana include littering and poor waste collection and disposal

Through this emphasis in the NCS, the environmental health management problem became a key focus for developing a citizenry that will take full responsibility for its environment. Consequently, schools have been charged with the responsibility of producing environmentally responsible learners who will be able to handle the demands of ever increasing pressure of environmental challenges in their society (Cantrell & Nganunu, 1992). The National Environmental Education Strategy and Action Plan (NEESAP) which translated the NCS policy intent into actions, recommended the infusion of environmental education into the national curriculum in 1997. Assessing the impact of the implementation of the infusion of environmental education and to accommodate new environmental needs and interests of its stakeholders, NEESAP stated and emphasised as one of its main guiding principles of environmental education that a “participatory approach shall be given special attention in planning and implementing environmental education activities and initiatives with a direct, perceived benefit to the learners” (Botswana Government, 2007, p. 9). Schools in Botswana seem to have generally used environmental health, specifically sanitation management to meet this objective as demanded by the infusion policy.

Sanitation management in schools

Research done on sanitation management in Botswana has repeatedly called on a comprehensive environmental education programme that should address waste generation at source that is geared towards reduction, recycling, and re-use of solid waste (Somarelang Tikologo, 2004; Kgathi & Bolaane, 2001, Ketlogetswe & Mothudi, 2005). At best, current practices of sanitation management in schools in Botswana involve routine activities that are tailored towards meeting these requirements through normalised activities (Ketlhoilwe, 2007) which include cleaning classrooms and school grounds, community litter campaigns, as well as collection of cans and bottles for recycling. In all these initiatives, sanitary conditions are supposed to be central if the country is to have citizenry that can live in a healthy environment by 2016 (Government of Botswana/UNDP, 2000; Cantrell & Nganunu, 1992). But recent research has shown that due to culturally and historically formed views of environmental education, schools continue to view and focus on litter management as the

primary sanitation challenge, and this is their primary environmental education concern (Ketlhoilwe, 2007; Silo, 2011). Yet on the other hand, students identify sanitation management in the school toilets as their primary sanitation management concern. This raises the question on what the main gap in the management of sanitation could be. This research sought to investigate what the main problem with sanitation in selected schools in Botswana could be.

Research Methodology

The research drew on three case studies. These were drawn from three primary schools in Botswana, whose names have been concealed for ethical reasons arising from some sensitive issues raised by pupils in the research. The selection of case studies was contextually driven as is advised in most qualitative research (Yin, 2003; Cohen, Manion & Morrison 2007). The selection of the three schools (urban, peri-urban and rural) was based on the diversity of the socio-cultural historical factors at play in these three contexts (Jonassen & Rohrer-Murphy, 1999). The three schools are located within a similar broader national context and specific local contexts.

The data was largely generated from through focus group interviews during workshops with a group of seven to ten pupils and observations of sanitation management activities. These two methods formed the main data generation methods. They were complemented by semi- structured interviews with teachers, cleaners and other actors in the school sanitation management activity systems.

Results

Sanitation as a health and an environmental issue

It was clear that teachers and pupils in all schools were concerned about the environmental health status of their school with particular emphasis on toilet sanitation. They felt the problems were specifically caused by poorly maintained and inadequate toilets, poor utilization of toilets and the shortage of facilities such as girls' sanitary bins, toilet paper and gloves for picking up litter around the toilet area, a practice they felt was highly unsanitary. In one school pupils largely blamed this poor state of sanitation to lack of care and concern for their welfare by their teachers whom they felt did not take their plight seriously (see extracts below).

Extract 1: Pupils lamenting on the state of toilets

R: Why do the boys relieve themselves all over, don't they have toilets?

P1: They have no toilets, what we mean is, there are toilets. The flush system ones, but they are not functional. So they are locked and now they [boys] use those ones which

you saw [pit latrines] which are dirty so they have decided to relieve themselves anywhere in the grass outside behind the toilets.

P3: But now they are so messed up, behind them, inside on seats and on the floor, its so messy and the boys no longer use them and they go outside and the surroundings are so messy and smelling

P1: Yes! You see that grass down there!!! You can't go there [sic] because it's so messy, but still its better using it than our toilets. Think of it Mrs Silo, we are...so many in this school and for girls we only use two toilets, only two for more than 500 girls, just think of that.

P1: I don't see any solution in their being locked because the ones they now suggest boys should use, are not cleaned and they [boys] are now no longer using them and when they utilise the space outside the toilets, they are told not to do that and to use the toilets and yet they (teachers) know that the toilets are not in a usable state, so boys can't use those toilets. They can be given soap to clean them so that they can use them. So it's all futile exercise.

P6: The problem is that the teachers are not even interested in seeing the state of our toilets. They know that they do have a toilet next to the kitchen. But as for us, what we use, they just don't care about us. They don't see us as people. I mean imagine for us girls, only two toilets for so many of us! How many are we? I guess more than 500 because I know we are more than boys (AFP1).

In one school poor sanitation management was blamed on inadequate labour, with only one cleaner for a school as large as theirs with a population of 984 pupils. In another school pupils blamed the poor sanitation of toilets on the incorrect use by pupils and irregular cleaning by the cleaner. All this pointed towards the pupils' appreciation of the aesthetic value and health of the environment.

Extract 2: Cleaner's views

C: My job is to clean the children's classrooms, toilets, the headmaster's office, the school grounds, picking up litter, I can say all the litter in the school I am the one who is responsible for picking it up, but because I have too much work, at times children are instructed by teachers to do it, just to help me even though the policy does not allow them to.

Some examples of the ways pupils identified their concerns and how they felt these should be solved are illustrated in the extracts below;

Extract 3: School A pupils' view on sanitation problems and causes

R: Of the tasks that you do, which one do you find difficult?

P4: The difficult one is where we pick up litter without gloves around toilets and sometimes you find soiled toilet papers which has been used and you are told to pick it up and we complain that it can cause you disease and it's a hazard to your health we are told "what do you know, just pick it up?" And we are not given gloves.

P3: The lady who cleans toilets is also overburdened because there is a lot of work in those toilets. When girls use toilets, they leave without flushing them and they are not nice to look at.

R: So in other words what you are trying to say is children also don't use toilets properly?

P1: What I am trying to say is that toilet paper is not placed in the toilets for us and so the children will then use the toilets carelessly.

P8: They [older girls] are showing kids horrible things [soiled sanitary pads]. Because after that, they [little children] touch and then go and eat food without washing hands, because they don't know what these things are. They should see what to do about this (AFP1).

One major cause attributed to by schools was government policy. In 2006 a policy which came as a directive from the Ministry of Local Government and Lands (MLGL) under whose administration all primary schools fall, was enacted barring pupils from undertaking certain cleaning activities. However, in the schools' practices, all cleaning in Botswana public schools has routinely been done as part of extra-curricular activities by pupils and without an emphasis on environmental values. The environmental value attached to these routine cleaning activities was always implicit but only became highlighted by the inception of the infusion policy when the cleaning activities became equated with environmental education as revealed by Ketlhoilwe, (2007). This ministerial directive specifically stipulates that pupils should not be involved in cleaning activities, particularly bush and grass clearing, and though not stipulated in the directive, toilet cleaning is also no longer done by pupils in schools. While it is not clear what motivated the enactment of this policy, it has been speculated that cleaning activities were interfering with formal teaching and the primary objective was to move pupils from being 'cleaners' to 'learners'. Or perhaps pupils were exposed to ecological and health risks and it was in the interest of the pupils' safety and health. However it would be interesting to find out how the directive is implemented in the light of sanitation management activities, given Ketlhoilwe's (2007) findings that these

activities had been normalised in the school curriculum by equating them to environmental education. While this directive specifically bars pupils from toilet cleaning and grass clearing, the general understanding in most schools is that pupils should not even be involved in classroom cleaning. But pupils were observed doing this, verifying the normalising strategies that Ketlhoilwe observed. Local district councils have now employed cleaners to undertake the general cleaning duties in schools which particularly include toilet and classroom cleaning. But as far as teachers, cleaners and pupils themselves, this has exacerbated the poor sanitation conditions in schools in Botswana as revealed by the extracts below.

Extract 4: School B teacher about the directive

T: Children mma, no longer clean at all. It's a big offence. They don't clean they don't clear grass, they don't sweep classrooms, they don't mop. Because these women have been employed specifically for that, because if children start doing that they are taking those ladies' job which will mean that they end up with no job and they will relax knowing that after all the children will do the job for them. That is why we decided just to get them something to do, litter picking, and litter picking campaigns in the neighbourhood, that's the only way we can have them at least contribute something because they have to learn that a clean environment is important. (BT1)

Extract 5: School A teacher's remark on limitation created by the directive

T3: Waii, [expression of resignation] they [council/municipal] has knocked off, there is nowhere you can see or hear about them when it comes to surroundings. Before mma! these children were the ones who were doing all the cleaning, but now as we speak, and as you can see the way things are and since the policy came into being, there should be people employed to clean but as you can see. After we were told emphatically that children should not clean. Now everything has stopped tsii!! tsii!...I mean tsii! [This is a description of something coming to a halt like car brakes] You can see for yourself how dirty the school is. Wherever you throw your eyes its dirt, dirt just all over the place (ATI)

Extract 6: School C Teacher about the directive

T: Children mma, no longer clean at all. It's a big offence. They don't clean they don't clear grass, they don't sweep classrooms, they don't mop. Because these women have been employed specifically for that, because if children start doing that they are taking those ladies' job which will mean that they end up with no job and they will relax knowing that after all the children will do the job for them. That is why we decided just to get them something to do, litter picking, and litter picking campaigns in the

neighbourhood, that's the only way we can have them at least contribute something because they have to learn that a clean environment is important. (CTII)

Extract 7: School C head (H)'s dilemma in response to the ministerial directive

H: ...we don't really feel good about it [directive] because that's [children's cleaning] part of learning. Besides keeping the school clean which is important, as well the child has to be responsible because by so doing you are trying to build the child to be divergent, without them expecting things to be done for them all the time. The child has to know that if he goes out there and comes across a can he has to pick it, or if he doesn't clear grass, he can be bitten by a snake as you can see how tall that grass is. But now our hands are tied because if now they say we should not use children to do all these things how can they learn to be responsible... (CHII).

Discussion

As part of fulfilling the curriculum objective of embracing environmental education, sanitation management in Botswana schools usually takes the form of cleaning activities, litter campaigns and recycling activities. But as observations were done when pupils were doing this work, it was striking how they were simply cleaning the area as has been the norm many decades before, when pupils were required to do the same thing to keep schools clean and tidy. Yet related to Ketlhoilwe's observation, in interactions with teachers and pupils, they described how school cleaning was part of environmental education activities. These are all seen as part of a comprehensive environmental education programme that addresses waste generation at source geared towards reduction, recycling, and re-use of solid waste (Kgathi & Bolaane, 2001; Grodzinska-Jurczak, Bartosiewicz, Twardowska & Ballantyne, 2003; Grodzinska-Jurczak, 2003). However, Grodzinska-Jurczak (2003) argues that it is important to establish whether these campaigns are supported by theoretical knowledge or whether they only focus on developing specific behaviours, without thorough understanding of their sense and purpose. Glažar, Vrtačnik & Bačnik (1998) note that pupils who undertake these cleaning activities on a regular basis often show considerably low pro-environmental agency (Jensen, 2002; Kollmuss & Agyeman, 2002), and analysing the question of their motives for undertaking such campaigns seems to be necessary.

Grodzinska-Jurczak (2003) also noted that sanitation management activities are common in schools and these are associated with campaigns organised to pick up litter and collect cans and bottles and a widespread promotion of waste recycling. She concurs with the findings of a study that was carried out in Botswana (Ajiboye & Silo, 2008) and South African and Botswana primary schools (Silo, 2008) that indicated that primary school

children knew what recycling was, because they did it during class, but either they did not know the importance and purpose of recycling (Silo, 2008) or it did not reflect knowledge that had direct local relevance (Ajiboye & Silo, 2009). However, Grodzinska-Jurczak (2003) contends that for pro-environmental actions (Jensen, 2002; Stevenson, 2007; Kollmuss & Agyeman, 2002) to be undertaken by pupils in their everyday life, in addition to knowledge, other components must be present. It is important for such campaigns to be combined with detailed discussion of the topic that covers the activity in their syllabus, providing pupils with the foundation for understanding which should motivate pupils to develop such action later in life (Grodzinska-Jurczak, 2003).

It seems an important task to develop in pupils a sense of responsibility for the environment by engaging them in any potential ways that affect their daily lives and their future. Teaching skills essential for successful functioning in society is also necessary so that their optimistic attitudes as they participate in these activities will not degenerate into a sense of helplessness (Tilbury, 1995; Oscarsson, 1996) when they face real problems beyond their formal schooling. To be able to achieve this task and to respond to the socio-ecological challenges that pupils face, there is a need for a context based educational approach that looks at the mediating factors in the pupils' participation that will remove barriers which disregard their role as potentially full stakeholders in their learning (Barratt Hacking, Barratt & Scott, 2007; Barratt & Barratt Hacking, 2008). Botswana has made attempts to meet this need through education reform policies which are supposed to be learner centred to develop human capacity that will enable and nurture pupils by moving them from being mere actors or participants to learners who are reflexive and co-engaging contributing stakeholders. This apparently serious sanitation challenge that the schools were faced with, could have been used as a learning activity that could foster creative skills and values in the school community to create a healthy environment for the school. At policy level there is no contradiction or conflicting objective between the Ministerial directive or policy that barred pupils from cleaning, but at practice level, teachers mis-interpreted the policy and this resulted in an unintended outcome whereby it was seen to be the main cause of poor sanitation in the schools.

While there seems to be no obvious tension between the curriculum motive arising from non-involvement of pupils in cleaning activities and the directive, one begins to note a contradiction emerging between the curriculum imperative to have environmental activities in schools and the directive which according to teachers limits seems to limit active participation in sanitation management activities that could keep the school clean. These

schools in Botswana need to take an action-oriented approach to the sanitation problems they seem to be battling with.

Jensen (2004, p. 411) qualifies the need for foregrounding the concept of action in developing action competence for these schools to address the serious sanitation challenges they face for the following reasons, as indicated below:

- *The 'scientific' focus on giving students knowledge about the seriousness and extent of environmental problems has not been able to incorporate the social and societal perspectives involved in questions about action possibilities, for society and for the individual.*
- *Moralizing, behaviour-modifying teaching never—or only very rarely—leads to the intended behavioural changes. This has brought about a new focus on 'student action'.*
- *The growing criticism that schools give priority to the 'academic' at the expense of the more practical has led to increased interest in the 'action-oriented'.*
- *Criticism of the schools' work with artificial 'as if' situations, e.g. role-playing, has led to demands for authenticity and for participation in the reality of society as part of teaching.*

The action competence approach seen in this perspective also challenges self-governing strategies observed in environmental education activities in these Botswana schools as these tend to perpetuate moralistic tendencies which conceal preconceived ideas and hidden agendas when dealing with socio-ecological issues such as the sanitation problem prevalent in their schools. Hence action competence calls for participatory approaches that give rise to teaching and learning sequences that deal with societal issues involving conflicting interests within school communities between pupils and teachers and other stakeholders. Understood this way,

... the action competence approach points to democratic, participatory and action-oriented teaching–learning that can help students develop their ability, motivation and desire to play an active role in finding democratic solutions to problems and issues connected to sustainable development that may even consist of the aforementioned tendencies, ideas and agendas (Mogensen & Schnack, 2010, p.62).

The action competence philosophy is critical towards any reductionist tendency (Breiting, 1993) in environmental education as observed in the technicist sanitation management activities in Botswana schools where the goal of such activities is to merely

have a clean school by changing the pupils' behaviour (Jensen & Schnack, 2006; Jensen, 2002). Pupils in these activities within the action competence agenda must also be critically explored when seen from the philosophical perspective of the action oriented approach (Schnack, 2008; Mogensen & Schnack, 2010; Simovska, 2008). Activity without an action competence perspective which is *action-oriented* very easily becomes dogmatic and moralistic according to Mogensen and Schnack (2010, p.62).

As discussed above Jensen and Schnack and other proponents of the action competence approach the main goal of environmental education is to develop the pupils' ability to act and effect change as well as develop civic agency in environmental activities such as sanitation management activities. This then follows that any participation in these activities should be action oriented.

Conclusion

If Botswana is to achieve its vision of being an environmentally healthy and educated nation by 2016 (Botswana Government, 1996), then schools need to re-orient their approach to sanitation management from being activity oriented to action oriented. In this research, it emerged that schools in Botswana face socio-ecological risks associated with poor sanitation management, especially in urban, peri-urban and rural areas from where the case studies in this study were drawn. To address these issues in order to achieve social, economic and ecological sustainability, there is a need to build social-ecological resilience and capability to face issues that affect schools daily. This can take place when school activities link everyday experiences with action as well as social learning, which jointly addresses sanitation problems associated with schools' socio-ecological issues such as poor sanitation. This need became evident in this research where in all three case studies, both teachers and pupils were concerned with the poor toilet sanitation in their schools. It seems that good policies may not naturally translate into practical social transformation in response to issues and challenges that seek to be addressed in the society that the schools in this study are part of. Additional emphasis is needed on pedagogy and learning how to translate such policies into relevant practice in order to respond to the needs of the schools (Chisholm & Leyendecker, 2008).

References:

Ajiboye, J. O. & Silo, N. (2008). Enhancing Botswana Children's Environmental Knowledge, Attitudes and Practices through the School Civic Clubs *International Journal of Environmental & Science Education*, 3(3), 105-114.

- Barratt, R. & Barratt Hacking, E. (2008). A Clash of Worlds: Children Talking about their Community Experience in Relation to the School Curriculum. In Reid, A.; Jensen, B.; Nikel, J.; & Simovska, V. (Eds): *Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability*. Copenhagen, Springer.
- Barratt Hacking, E., Barratt, R., & Scott, W. (2007). Engaging children: Research issues around participation and environmental learning. *Environmental Education Research* 13(4), 529-544.
- Botswana Government. (1990). National Conservation Strategy Agency: *National policy on natural resources conservation and development*. Gaborone: Government Printer.
- Botswana Government, (1994). *The Revised National Policy on Education*. Gaborone: Government Printer.
- Botswana Government. (1997). *National Vision 2016. Towards prosperity for all*. Gaborone: Government Printer.
- Botswana Government, (2002). National Conservation Strategy Agency. (2002). *State of the environment report*. Gaborone: Government Printer.
- Botswana Government. (2003). *National Development Plan 9 (NDP 9): 2003/04-2008/09*. Gaborone: Government Printer.
- Botswana Government (2007). National Environmental Strategy and Action plan (NEESAP). Gaborone, Botswana Government Printer.
- Breiting, S. (1993). The New Generation of Environmental Education Focus on Democracy as part of an Alternative Paradigm. In Mrazek, R. (Ed). *Alternative Paradigms in Environmental Education Research. Monographs in Environmental Education and Environmental Studies*, Vol. VIII. New York. The North American Association of Environmental Education.199-202.
- Cantrell, M & Nganunu, M. (1992). Environmental Education in Botswana: A National Planning Conference. In M. Cantrell and M. Nganunu (Eds.), *Towards better quality of environment and education*. Gaborone:Government of Botswana, University of Botswana and Kalahari Conservation Society.
- Chisholm, L. & Leyendecker, R. (2008). Curriculum reform in post-1990s sub-Saharan Africa. *International Journal of Educational Development*, 28, 195–205.
- Cohen, L., Manion, L. & Morrison, K. (2007). *Research methods in education*. (6th edition) London: Routledge.
- Fako, T. T. & Molamu, L. (1995). The Seven-Year Drought, Household Food Security and Vulnerable Groups in Botswana. *Pula: Botswana Journal of African Studies*, 9(2), 48-70.

- Glažar S. A., Vrtačnik, M. & Bačnik, A.(1998). Primary School Children's understanding of municipal waste processing. *Environmental Education Research*, 4(3), 299-308.
- Grodzinska-Jurczak, M. (2003). The relationship between education, knowledge and action for better waste management in Poland. *Waste Management Research* 21, 2-18.
- Grodzinska-Jurczak, M., Bartosiewicz, A., Twardowska, A. & Ballantyne, R. (2003).Evaluating the impact of a school waste education programme upon students', parents' and teachers' environmental knowledge, attitudes and behaviour. *International Research in Geographical and Environmental Education*, 12(2), 106-122.
- Gwebu, T. D. (2003). Environmental problems among low income urban residents: an empirical analysis of Old Naledi-Gaborone, Botswana. *Habitat International* 27(3), 407–427.
- Jensen, B. B.(2002). Knowledge, action and pro-environmental behaviour. *Environmental Education Research*, 8(3), 325-334.
- Jensen, B. B. (2004) Environmental and health education viewed from an action-oriented perspective: a case from Denmark. *Journal of Curriculum Studies*, 36(4), 405–425.
- Jensen, B. B. & Schnack, K. (2006). The action competence approach in environmental education. *Environmental Education Research* 12(3&4), 471 – 486.
- Jonassen, D. H. & Rhohrer-Murphy, L.(1999). Activity theory as a framework for designing constructivist learning environments. *ETR & D*. 47(1), 61-79.
- Ketlhoilwe, M. J. (2007). Environmental education policy interpretation challenges in Botswana schools. *Southern African Journal of Environmental Education*, 24, 171-184.
- Ketlogetswe, C. & Mothudi, T. H. (2005). Botswana's environmental policy on recycling. www.elsevier.com/locate/resconrec. (retrieved 14/03/2008).
- Kgathi, D. L. & Bolaane, B. (2001). Instruments for sustainable solid waste management in Botswana. *Waste Management Research*, 19, 342-353.
- Kollmus, A. & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and the barriers to pro-environmental behaviour. *Environmental Education Research*,
- Maundeni, T. & Mookodi, G. (2004). Introduction: Critical Social Challenges in Contemporary Botswana. *Pula: Botswana Journal of African Studies*, 18(1), 4-6.
- Mogensen, F. & Schnack, K. (2010). The action competence approach and the 'new' discourses of education for sustainable development, competence and quality criteria. *Environmental Education Research*, 16(1), 59-74.
- Molebatsi, C. (1998). Urban Environmental Problems in Botswana. In Atlhopheng, J., Molebatsi, C., Toteng E., & Totolo, O. (Eds.), *Environmental Issues in Botswana – A Handbook*. Gaborone: Lightbooks. 131-155.

Oscarsson, V. (1996). Pupils' views on the future in Sweden. *Environmental Education Research*, 2, 261–277.

Preece, J. & Mosweunyane, D. (2004). *Perceptions of Citizenship Responsibility amongst Botswana Youth*. Botswana: Light Books.

Schnack, K. (2008). Participation, Education and Democracy: Implications for Environmental Education, Health Education and Education for Sustainable Development. In Reid, A., Jensen, B. B., Nikel, J. & Simovska, V. (Eds.), *Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability*. Copenhagen: Springer.181-196

Segosebe, E. M., & Van der Post, C. (1991). *Urban industrial solid waste pollution in Botswana: Practice, attitude and policy recommendations*. National Institute of Research and Documentation (NIR) paper No. 17. University of Botswana, Gaborone.

Silo, N. (2008). *Environmental education practices in schools: Participation for action competence*. A paper presented at an Environmental Education Association of Southern Africa (EEASA) conference. 26 July – 1 August, 2008. Manzini, Swaziland.

Silo, N. (2011) Children's Participation in Waste Management Activities as a Place-Based Approach to Environmental Education. *Children, Youth and Environments* 21(1)128-148

Simovska, V.(2008). Learning *in* and *as* participation: A case study from health-promoting schools. In A. Reid, B. B. Jensen, J. Nikel & V. Simovska (Eds.), *Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability*. Copenhagen: Springer.61-80.

Stevenson, R. B. (2007). Schooling and environmental education: Contradictions in purpose and practice. *Environmental Education Research*, 13(2), 139-153.

Tilbury, D. (1995). Environmental Education for Sustainability: defining the new focus of environmental education in the 1990s. *Environmental Education Research*, 1, 195–212.

Toteng, E. N. (2001). Urban Environmental Management in Botswana: Toward a Theoretical Explanation of Public Policy Failure. *Environmental Management*. 28(1), 19–30.

United Nations. (2005). *Millennium development goals report*. New York: United Nations.

UNDP, (2005). Botswana Human Development Report. *Harnessing Science and Technology for Human Development*. Gaborone, PPCB.

http://www.sarpn.org.za/documents/d0001252/Botswana_HDR_2005.pdf (retrieved 03/04/2008)

Yin, R. K. (2003). *Case Study Research: Design and Methods* (3rd ed.). London: Sage.